

FIG. 1

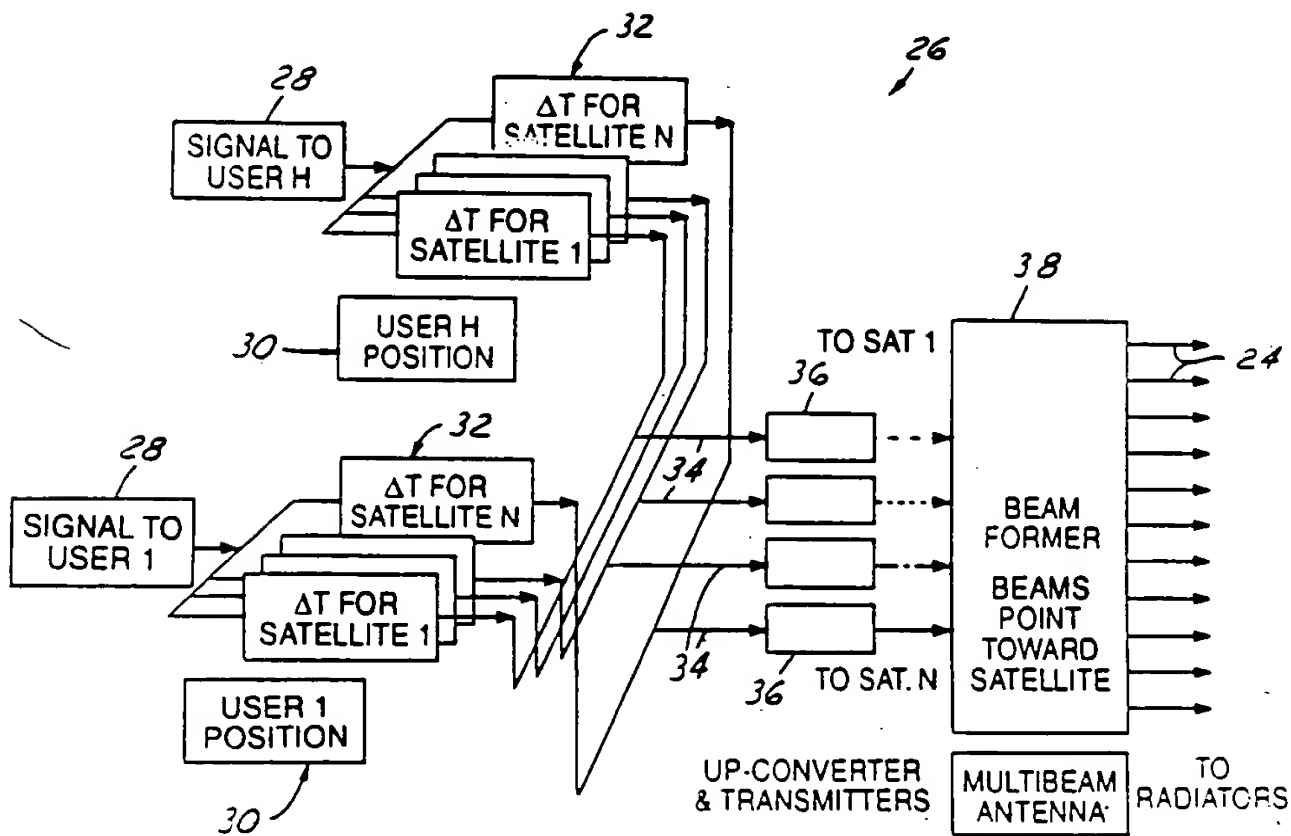


FIG. 2

000000 01952500

The diagram illustrates a communication system architecture. On the left, a central node labeled 12 is identified as 'RECEIVE PROCESSING CENTERS'. It is connected to a series of nodes labeled 10, 14, and 16, which are arranged in a fan-like pattern. These nodes are further connected to a set of nodes labeled 18, 22, and 24, which are arranged in a similar fan-like pattern. The connections between the central node 12 and the nodes 10, 14, and 16 are shown as solid lines. The connections between the nodes 10, 14, and 16 and the nodes 18, 22, and 24 are shown as dashed lines. The nodes 18, 22, and 24 are labeled 'USERS'. The diagram also includes a label 40 pointing to a specific connection path and a label 42 pointing to a group of connections.

The diagram illustrates a multibeam antenna system (44) for satellite communication. It features a central **BEAM FORMER** (38) and a **MULTIBEAM ANTENNA** (42) with multiple radiators. The system is divided into two main user sections: **USER H** and **USER 1**.

USER H Section:

- USER H POSITION** (50) provides input to the system.
- SIGNAL TO USER H** (50) is the output signal.
- ΔT FOR SATELLITE N** (48) and **ΔT FOR SATELLITE 1** (48) are time delay blocks.

USER 1 Section:

- USER 1 POSITION** (50) provides input to the system.
- SIGNAL TO USER 1** (50) is the output signal.
- ΔT FOR SATELLITE N** (48) and **ΔT FOR SATELLITE 1** (48) are time delay blocks.

Antenna and Receiver Section:

- The **BEAM FORMER** (38) receives signals from the **RECEIVERS & DOWN-CONVERTERS** (46).
- The **BEAMS POINT TOWARD SATELLITE** (46) are the output signals from the beam former.
- The **FROM SAT. N** (46) and **FROM SAT. 1** (46) are signals received from the satellites.
- The **FROM RADIATORS** (42) are the signals received from the antenna radiators.

FIG. 4

HUB SEGMENT

PATH DIFFERENTIAL USER POSITIONING

➤ PRE-PROCESSING
FWD BEAMFORMING

HUB
PROCESSING

POST PROCESSING RTN BEAMFORMING

CALIBRATION & TRACKING

SPACE SEGMENT

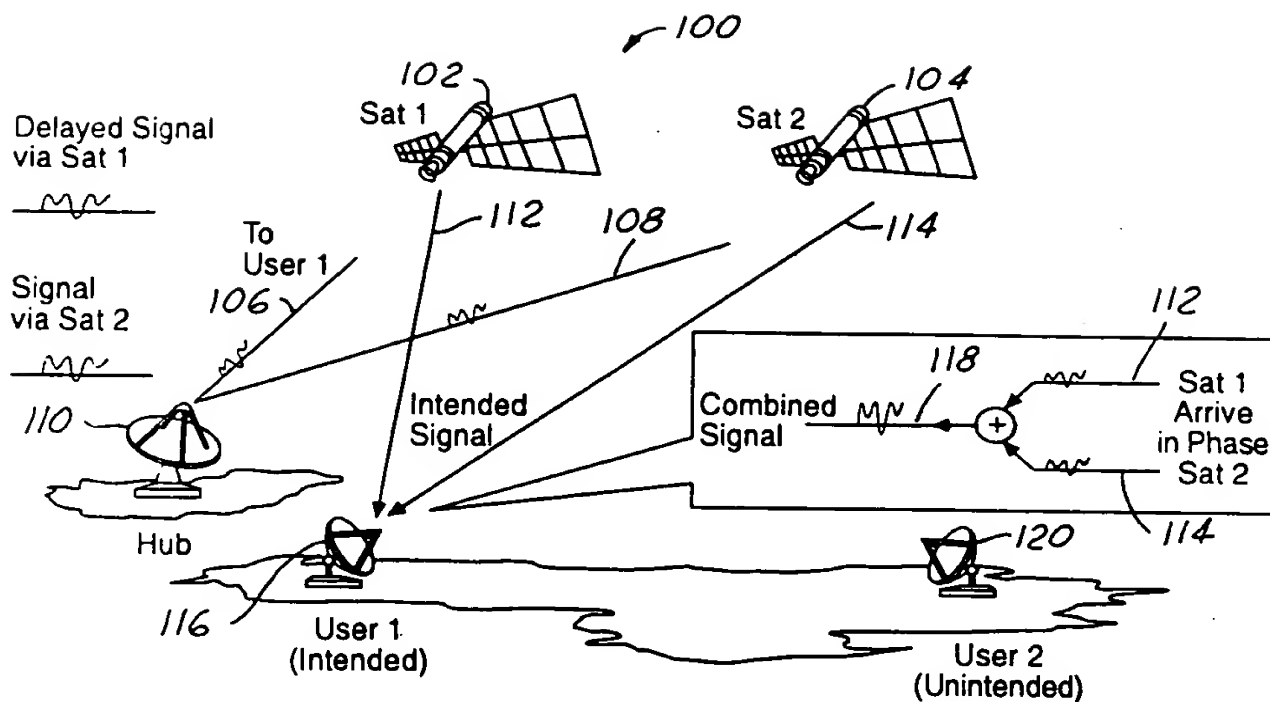
USER SEGMENT

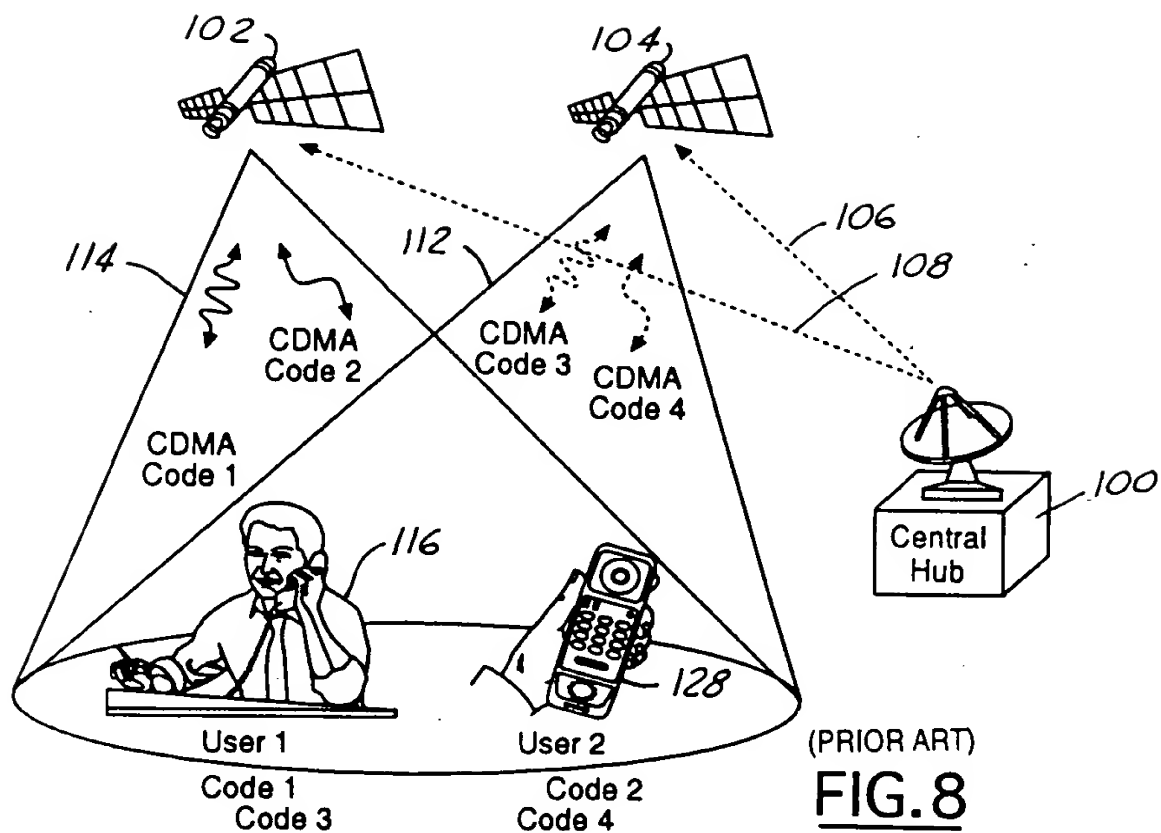
SATELLITES

USERS

FIG. 5

[illegible]





(PRIOR ART)
FIG. 8

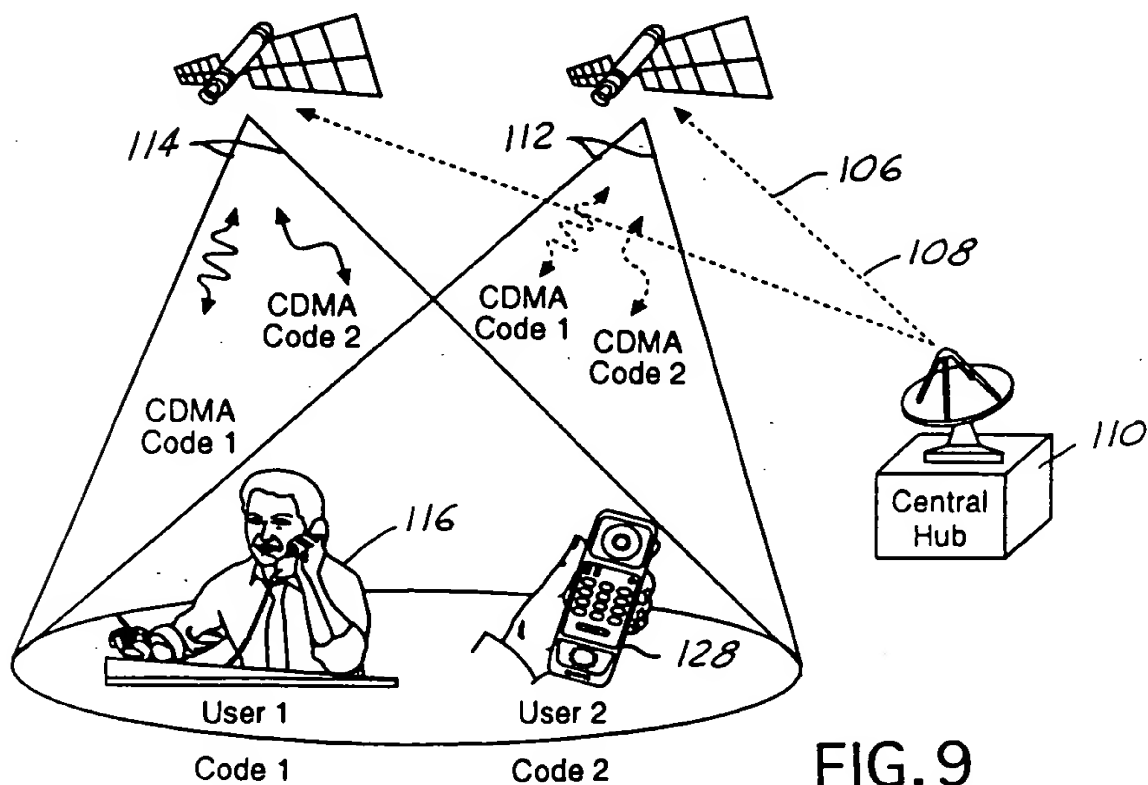


FIG. 9

S = Signal Power
 N_1 = Interference Noise Power
 n_c = CDMA Code Length
 n_t = No. of Transponders Available
 n_u = Number of Total Users
 W = Bandwidth
 R = Data Rate

FIG. 10

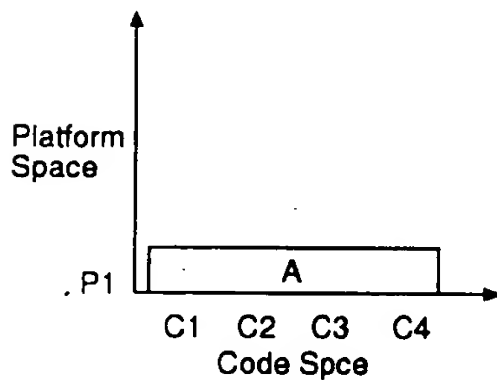


FIG. 11

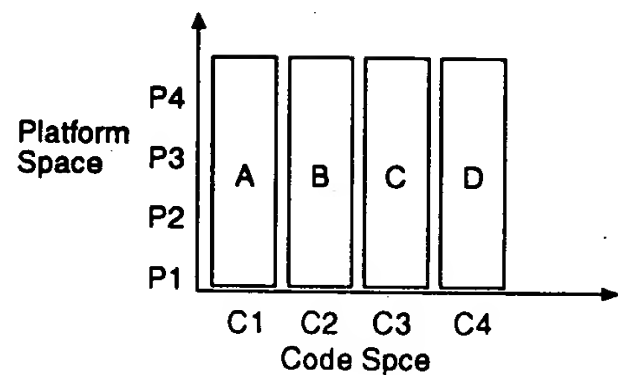


FIG. 12

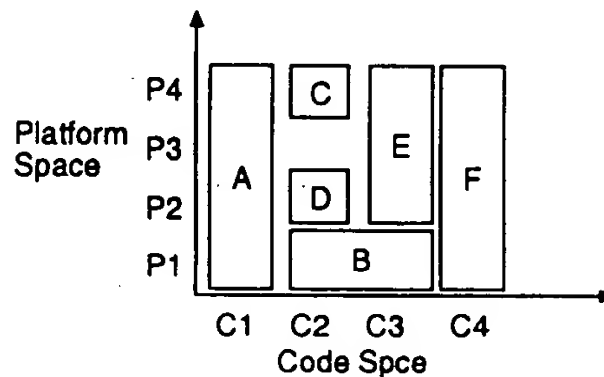


FIG. 13